Can Prolaris Score be used to predict change in Gleason Score from biopsy to post-radical prostatectomy pathology?

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Can Prolaris Score be used to predict change in Gleason Score from biopsy to post-radical prostatectomy pathology?

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Background

- Early detection of prostate cancer (PCAs) and the increasing popularity of active surveillance necessitate the development and refinement of risk stratification tools.
- While Gleason Score (GS) serves a valuable prognostic role, a relatively high rate of discordance1 between biopsy and post-surgical pathology necessitates either additional prognostic tests or a method to predict the likelihood of grade discrepancy.
- Genomic analysis has emerged as a reliable method to improve risk stratification for men with prostate cancer, especially for those with low- and intermediate-risk disease, in whom conservative management is an option.
- The Cell Cycle Progression Score (CCPS) – or Prolaris Score (Myriad Genetics) – measures expression of genes involved in Cell Cycle Progression. It has been validated in numerous settings as a predictor of cancer-related death and biochemical recurrence.2 The score is used to predict whether an individual’s cancer is more aggressive, less aggressive, or consistent with others in his AUA risk group.
- Thus far, the ability of the CCPS to predict a change in GS between biopsy and post-surgical pathology has not been evaluated.

Problem Statement

In the context of a significant rate of discrepancy in prostate cancer pathologic grading between biopsy and post-surgical analysis, this project seeks to determine whether or not the genomic Cell Cycle Progression Score can be utilized as a predictor for grade change.

Methods

Lehigh Valley Hospital is a large, mixed rural/urban teaching hospital. For this IRB-approved retrospective analysis, we evaluated men with PCa who underwent treatment with RP between 2015 and 2017.
- Patients stratified by AUA risk score: low (LR), intermediate (IR), and high (HR) groups
- Sub-grouped by change in GS: upgraded, downgraded, or no change, i.e. 3+4 → 4+3 is an upgrade
- CCPS for each patient normalized to 0-average in each respective AUA risk group, using information from Prolaris Score Report (based on data collected by Myriad Genetics)
  - Negative numbers less aggressive, Positive numbers more aggressive
- Mean CCPS deviation for each GS-change subgroup calculated to assess for correlation between grade-change and CCPS-predicted risk.

Results

- 65 Men underwent radical prostatectomy after Prolaris analysis between 2015-2017: Table 1
  - 63% with biopsy GS ≤ 3+4
  - 49% rate of GS discordance: 21.5% downgraded, 27.7% upgraded

- Mean CCPS deviation for each group detailed in Table 2
  - One-way ANOVA showed no significant difference in CCPS between grade-change groups (p = 0.5832)
  - ANOVA of Intermediate-risk group (n=44) also showed no significant difference (p = 0.4196)
  - 7 of 22 with CCPS deviation < 0.3 had GS upgrade and 8 of 15 with deviation -0.2 to 0.2 had GS discordance (Figure 2)
  - Mean CCPS deviation in no-change group was within “consistent” range (-0.18 ± 0.56) but not statistically different from other groups and had significant deviation
  - Intermediate-risk group had nearly even distribution of CCPS deviation between GS grade-change subgroups (Figure 3)

Discussion

- Several management options exist for men with LR and IR PCa
  - Decision to undergo surgery vs. surveillance dependent on degree of risk and patients’ wishes
  - High degree of Values-based Patient-centered Care (VBPC) required in decision-making
  - Genomics shown to alleviate some of mental treatment burden in PCa patients4
  - Prognostication with GS high degree of variance
  - Literature discordance rate: 30%1
  - Study discordance rate: 49%

- Our results do not suggest predictive ability of CCPS to determine final pathologic GS
  - “Consistent” CCPS does not guarantee GS concordance
  - VBCC conversations able to use GS and CCPS score as independent risk-stratification tools

- Limitations: smaller than expected sample size (many more pathoanatominies than genomic tests)
  - Will standardize consent for genomic testing in future protocols

Conclusions

When analyzed as a whole, and when stratified by AUA risk, there was no correlation between average CCPS deviation and grade change from biopsy to post-RP pathology. Furthermore, there was no significant difference between average CCPS scores in the different grade-change groups. Our data suggest the CCPS may not be used to reliably predict a change in biopsy GS.

REFERENCES


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